

# Tree and Sidewalk Policy Report

## Prepared by Cincinnati Park Board and Department of Transportation and Engineering April 2011

### **Why Cincinnati's street trees are economically important**

**Trees clean the air.** Tree foliage works as a natural air filter of particulate matter such as dust, micro sized metals and pollutants such as ozone, nitrogen oxides, ammonia and sulfur dioxides. Trees take in carbon dioxide and produce oxygen. Combined with the cooling effect of trees, these processes can have a significant impact on reducing smog and overall air pollution.

**Trees improve water quality.** A healthy urban forest can have a strong influence on our region's water quality. Tree canopies and root systems slow and reduce storm water runoff, flooding and erosion. Trees also help filter water runoff reducing potential sources of water pollution into our rivers and storm drains.

**Quantification of these benefits in Cincinnati.** In 2010 the Park Board conducted a study of the tree canopy of Cincinnati. The study used GIS and remote sensing to map and create a forest canopy layer for the entire City. CITYgreen software was used to calculate the ecosystem services and value of Cincinnati's existing forest in dollars and resource units. The report that was generated estimates the benefits of canopy cover for air pollution removal capacity for 5 common pollutants, carbon sequestration (rate and storage) stormwater volume mitigated, and water quality (percent change in contaminant loading). The study found that the value of ecosystem services provided by Cincinnati's urban forest is \$32,404,029. This amount reflects all trees in Cincinnati, park trees, private property trees, and public street trees.

The Park Board estimates that our 85,000 street trees comprise 10 – 20% of the city urban forest canopy. **Applying the ecosystem services numbers conservatively at 10% results in a total amount of street tree benefits of \$3,240,402.00.**

**Trees save energy.** Trees cool the air naturally in two ways: through water evaporating from the leaves and direct shade. Homes shaded by trees need less energy for cooling which means lower monthly utility bills in summer and a reduced need for utilities to increase power generation to meet peak load demand. A 2001 CITYgreen analysis performed by the Park Board found that the average street tree saves the average household \$56.00 annually in cooling costs by avoidance of using electricity. **Our 85,000 street trees save Cincinnati citizens \$4,760,402 annually in air conditioning costs.**

### Summary of annual benefits provided by Cincinnati Street Trees

Stormwater, carbon, air pollution abatement	\$3,240,402.00
Energy Savings	<u>\$4,760,000.00</u>
<b>Total Benefits (1)</b>	<b>\$8,000,000.00</b>

Annual Maintenance Costs	\$1,800,000.00
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Return on \$1 Investment = \$4.44

Annual benefit for each tree	= \$94.12
Typical assessment on a 50' wide lot	= \$ 9.00
Net annual benefit	= \$85.12

### Benefits provided by street trees but not quantified in the above benefit analysis:

**Increase Real Estate Values.** Shaded neighborhoods and well-landscaped yards have a positive economic influence on real estate values, timeliness of house sales and neighborhood desirability. Healthy, mature trees add an average of 10 percent to a property's value. -USDA Forest Service

**Promote Economic Activity.** Trees in commercial parking lots induce shoppers to spend 11% more for goods and services. – International Society of Arboriculture.

### Economic factors related to sidewalk repairs associated with street trees

Average net annual benefit of a street tree =	\$85.12
Designed lifespan of a Cincinnati sidewalk =	20 - 25 years
Street tree benefits accrued over 20 years =	\$1,702.40
Average sidewalk block cost =	\$134.00
Number of sidewalk blocks that could be replaced = (over 20 years based on benefits received)	12.7

## Park Board Tree/Sidewalk Repair Fact Sheet



### RESOLVING TREE-SIDEWALK CONFLICTS

Big trees. Sidewalks. In many areas they work just fine together, making life nicer underfoot and overhead for everyone walking by. In other areas they just can't seem to co-exist without the walks cracking, buckling, and getting way out of line.

#### Why?

Most people believe that tree roots just get too big, raise the concrete, and cause the blocks to fail. While tree roots can contribute to defective walks, the underlying soil is most often the primary reason for sidewalk failure. Where the underlying soil type is one that shrinks and swells as moisture content changes, stronger sidewalk construction may be necessary to prevent lifting and shrinking. This might include mechanically compacting the soil or using thicker concrete. This adds to the cost but it will prolong the life of the sidewalk even when tree roots are not present.

The same soils, which cause sidewalk failure, also compound the problem by increasing the involvement of tree roots. These soils typically contain fine clay particles, which displace oxygen in the soil causing the tree roots to grow near the surface where oxygen is available. When these surface roots grow beneath a cracked or raised sidewalk, they become established and grow in diameter, causing the sidewalk to buckle.

#### Who pays for the repair of city-owned sidewalks?

Chapter 721 of the Cincinnati Municipal Code requires that the maintenance and repair of sidewalks are generally the responsibility of the abutting property owner. For residential property, if the property abuts 2 or more public streets, the property owner is responsible for repairs on only 1 frontage. That frontage is determined by:

- a. the parcel frontage containing the driveway; or
- b. where either both or neither property frontage contains a driveway, the parcel frontage upon which the street address is based.
- c. if neither subsection (a) or (b) apply, as determined by the City engineer based upon typical frontages for other parcels in the subdivision

**To report a hazardous sidewalk location, contact the Department of Engineering and Transportation at 352-4503 or the City's General Information Number 591-6000.**

### How can I prevent future conflicts?

- ◆ Contact the Hamilton County Soil and Water Conservation District at 772.7645 to find out what type of soil underlies your property. If the soil is weak, then your new sidewalk, patio or driveway should be built to withstand the limitations of the soil.
- ◆ Under special conditions, it may be advised by Parks and the Department of Transportation and Engineering to move the walk away from high value trees. A street opening permit may be necessary to relocate the sidewalk.

### What about the tree?

The Cincinnati Park Board will only remove a tree if it is dead, diseased, or dying, or structurally unstable. **To report a dangerous or dying tree, please call the Park Board's Natural Resource Management Section at 861.9070.**

When notified by the Department of Transportation and Engineering to repair a sidewalk and the work is within 15 feet of a public street tree, you should acquire a permit and choose a contractor from their approved list of available contractors and make sure that the contractor does the following work:

1. Carefully remove the defective sidewalk blocks without damaging the tree.
2. The contractor may remove, from under the walk area, any roots less than 4 inches in diameter. These roots must be cut off completely on both sides of the sidewalk. A suitable base material must then be compacted into the area formerly occupied by the roots.
3. If the contractor finds roots larger than 4 inches in diameter, they must barricade the area and call the Natural Resource Management Section at 861.9070 for an immediate inspection. In most cases a forester will respond within 2 hours.
4. A forester will inspect the roots and the tree. If the tree is hazardous or will become hazardous by cutting the large roots, the tree and stump will be removed as soon as possible to allow the sidewalk to be repaired.
5. If the tree is not in danger, the contractor will receive written instructions about which roots to remove and how to remove them.

**NOTE:** If large roots are cut without approval, or if careless work damages the tree, the contractor will be held liable for damages if the tree dies or falls.

## Comparison of Portland and Cincinnati Sidewalk Repair Policies

### PORTLAND

#### Minimum Sidewalk Width

Residential = 5'

High volume = 6'

CBD = 6'

**Radius Blockouts and reduced walk width  
When there is 6' of walk width remaining**

**Ramp over roots – Yes**

**Drop curbs (asphalt berms) – Yes**

### CINCINNATI

#### Minimum Sidewalk Width

Residential (existing walks) = 4'

Residential (new) = 5'

High volume, NBD's = 6'

CBD = 8'

**Only in limited situations when there is  
4' of clear walking width remaining**

**Ramp over roots –No. An asphalt patch is used to bridge sidewalk offsets as a temporary fix until the walk is replaced. Ramps would cause a perpetual maintenance problem that would be the abutting owner's responsibility. There are also ADA and continued growth of roots concerns.**

**Existing curb is left in place so that no roots are damaged until tree dies.**

**Other:** In some instance DOTE is willing to remove sidewalk blocks adjacent to tree cutouts to enlarge the root zone if the blocks are parallel to the curb and do not result in a reduction of sidewalk width.

### Inspection Policy

PORTLAND: If tree roots are found in the city right-of-way during the repair of sidewalk, driveway, corner, or curb, and could possibly be damaged by the repair work, it will be necessary to contact the Urban Forestry Division (503-823-4489) to request a root inspection. The City Forester will attach a root inspection card to a barricade on the job site with the inspection results. Root inspection reports made at other posted properties are faxed to the Sidewalk Repair Office where they are filed with corresponding posted property files.

CINCINNATI: see attached section from the City's Sidewalk Safety program brochure.

## COMPLAINTS

PORTLAND: Information received regarding hazardous sidewalk conditions in the city right-of-way at a specific location will be transferred to a TrackIT form and given to a Sidewalk Inspector for investigation. Hazardous conditions may be reported to the Sidewalk Maintenance office at 503-823-1711.

An Inspector will inspect, and post if necessary, the appropriate address(es). If the TrackIT form states that someone has tripped and fallen and/or the hazard is extreme, a **20 Day** posting is issued. The property owner will be given 20 working days to begin repairs. In addition, the Inspector will inspect the general area for hazards and post accordingly. A guideline for the "general area" is the block face involved with the initial complaint.

CINCINNATI: Information received concerning a hazardous sidewalk, either by phone or the City's CSR system, is forwarded to the City's Public Services Department for temporary repair. DOTE will follow-up with a field inspection and the abutting owner is sent a courtesy letter concerning repairs. Complaint is noted for future Sidewalk Safety Program official notification/assessment areas.